

Application Number: 09/840,012

A-67209-5/RMS/EL
[469420-000]**Detailed Claim Listing**

The following is a detailed listing of all claims that are, or were, pending in the present application. Please amend the claims as set forth in this detailed listing.

1-8. (Canceled)

9. (Withdrawn) The system described in Claim 1, wherein the beads are affixed to the distal end of an optical fiber bundle.

10. (Withdrawn) The system described in Claim 1, wherein the beads are located within etched wells at terminal ends of optical fibers of the bundle.

11. (currently amended): A ~~chemical analysis~~ method, comprising
preparing separate subpopulations of beads, each subpopulation carrying different
~~chemical functionalities that change first optical signatures of the beads in the presence of~~
~~targeted analytes;~~
encoding ~~second~~ an optical signature of the beads in each subpopulation with a
description of the chemical ~~functionalities~~ functionality carried by that subpopulation;
combining the subpopulations ~~to produce a system;~~
~~applying the system;~~
detecting binding of a target analyte to at least one of said subpopulations of beads
~~changes in the first optical signatures indicative of a presence of the targeted analytes;~~ and
decoding said ~~second~~ optical signature of the beads to identify the chemical
functionalities.

12. (currently amended): The method ~~described in~~ according to Claim 11, wherein
said encoding ~~the second optical signatures with a description of the chemical functionalities~~
comprises doping the beads with fluorescent dyes.

SF-1147122_1

Application Number: 09/840,012

A-67209-5/RMS/D
[469420-000]

13. (currently amended): The method ~~described in~~ according to Claim 11, wherein said encoding the ~~second optical signatures with a description of the chemical functionalities~~ comprises attaching encoding dyes to the beads.

14. (currently amended): The method ~~described in~~ according to Claim 11, wherein said encoding the ~~second optical signatures with a description of the chemical functionalities~~ comprises controlling a ratio of at least two dyes carried by each bead.

15. (currently amended): The method ~~described in~~ according to Claim 11, further comprising:

encoding the beads ~~with a description of the chemical functionalities~~ by entrapping dyes within or attaching dyes to the beads; and

applying the chemical functionalities to the beads.

16. (canceled)

17. (currently amended): The method ~~described in~~ according to Claim 11, further comprising changing the ~~first optical signature by the presence or absence of a fluorescent signal from the bead~~ wherein said target analyte comprises a label.

18. (canceled)

19. (withdrawn) An analytic chemistry sensor, comprising:

a bundle of optical fibers;

a population of beads carrying chemical functionalities at a distal end of the fiber optic bundle, light from individual bead being coupled into separate or groups of separate fibers of the bundle for transmission to the proximal end of the bundle

20. (withdrawn) The sensor described in Claim 19, wherein each one of the beads is located within separate wells formed at terminal ends of optical fibers of the bundle.

SF-1147122_1

Application Number: 09/840,012

A-67209-5/RMS/D
[469420-000]

21. (withdrawn) The sensor described in Claim 20, wherein the wells are formed by anisotropic etching of the cores of the optical fibers with respect to the cladding.

22. (withdrawn) The sensor described in Claim 19, further comprising a light source for exciting optically active chemicals bound to the chemical functionalities.

23. (withdrawn) The sensor described in Claim 19, wherein the population of beads includes separate subpopulations, each subpopulation carrying a different chemical functionality and an optically interrogatable code descriptive of the chemical functionality.

24. (withdrawn) The sensor described in Claim 23, further comprising a light source for exciting optically active chemicals bound to the chemical functionalities.

25. (withdrawn) The sensor described in Claim 23, wherein code of each subpopulation comprises fluorescent dyes.

26. (withdrawn) The sensor described in Claim 23, further comprising a filter and a frame capturing camera for detecting optical signatures indicative of a status of the chemical functionalities and optical signatures indicative of the encoding of the beads.

27. (withdrawn) A method for constructing and using an analytic chemistry sensor comprising:

forming wells at terminal ends of optical fibers within a bundle;
distributing beads carrying chemical functionalities within the wells; and
monitoring a status of the chemical functionalities from a proximal end of the bundle.

28. (withdrawn) The method described in Claim 27, wherein forming the wells comprises anisotropically etching of cores of the optical fibers with respect to cladding.

SF-1147122_1

Application Number: 09/840,012

A-67209-5/RMS/D
[469420-000]

29. (withdrawn) The method described in Claim 27, further comprising forming a population of beads in the wells from separate subpopulations, each subpopulation carrying a different chemical functionality and an optically interrogatable code descriptive of the chemical functionality.

30. (withdrawn) The method described in Claim 29, further comprising randomly distributing the subpopulations within the wells.

31. (withdrawn) The method described in Claim 29, further comprising serially adding the subpopulations to the wells.

32-39. (Canceled)

40. (currently amended) A chemical analysis method comprising:

a) contacting a population of beads with a composition comprising at least a first target analyte, wherein said population of beads comprises a first and a second subpopulation, the beads of each subpopulation comprising:

i) a chemical functionality ~~capable of changing a first optical signature of the bead in the presence of~~ for binding a target analyte; and

ii) ~~a second~~ an optical signature which is encoded with a description of said chemical functionality carried by the bead of the subpopulation;

b) ~~detecting a change in the first optical signature beads of at least one of said first or second subpopulation of beads~~ binding of said target analyte to said first population of beads;

c) decoding said ~~second~~ optical signature of said first population of beads to identify the first chemical functionality.

41. (currently amended) The method according to claim 40, wherein said ~~second~~ optical signature comprises fluorescent dyes.

SF-1147122_1

Application Number: 09/840,012

A-67209-5/RMS/D

[469420-000]

42. (previously presented) The method according to claim 41, wherein said beads doped with said fluorescent dyes.

43. (previously presented) The method according to claim 41, wherein said fluorescent dyes are attached to said beads.

44. (currently amended) The method according to claim 40, wherein said second optical signature comprises at least two dyes carried on each bead.

45. (previously presented) The method according to claim 40, wherein said first chemical functionality is selected from the group consisting of nucleic acids and proteins.

46. (previously presented) The method according to claim 45, wherein said chemical functionality is a nucleic acid.

47. (previously presented) The method according to claim 45, wherein said chemical functionality is a protein.

48. (new) The method according to claim 11, wherein at least one of said chemical functionalities is selected from the group consisting of nucleic acids and proteins.

49. (new) The method according to claim 48, wherein said at least one of said chemical functionalities is a nucleic acid.

50. (new) The method according to claim 48, wherein said at least one of said chemical functionalities is a protein.

SF-1147122_1